Review of the manuscript entitled “Turbulent kinetic energy dissipation rate and associated fluxes in the western tropical Atlantic estimated from ocean glider observations” by Peter M.F. Sheehan et al., submitted to EGUsphere

Overall:

This paper described turbulent energy dissipation rate ε obtained by glider observations from two methods: one is estimated by estimating Batchelor wavenumber using fast-response thermistor and the other is from Thorpe-scale density overturn. The former ε is less than the latter one. The turbulent heat and salt fluxes are reported not to be influential, while the salt-finger double diffusive fluxes could be influential. These results are potentially worth to be published, but need to be further analyzed, because both the discussions why the difference between the two methods and for the salt-finger fluxes are not enough.

Specific points:

1. Methods of estimating the ε is not enough. Time response of the fast-response thermistor probe is not enough and needs to be corrected even for the glider observations. The underestimation from the spectrum fit could be caused by insufficient spectrum correction. Also the original method for estimating Batchelor wavenumber was proposed by Oakey (1982) and Ruddick et al. (2000) which should be cited.
2. The regression coefficient between the Thorpe and Ozmidov -scales are also not decisive, and the Thorpe-scale method cannot estimate ε for depths without density inversions. The standard method for estimating ε is shear-probe measurements. Before comparing ε between the Batchelor and Thorpe methods, comparisons between shear and Batchelor and between shear and shear and Thorpe methods should be discussed or appropriate previous studies should be cited.
3. The estimation for the salt-finger double diffusive fluxes is relied on the parameterization for very simple situation. Discussion using the microstructure measurements should be done to evaluate the validity of the parameterization. The estimate of the density ratio R_ρ is quite important for the parameterization. The procedure (bin length for gradient estimates) should be further described.
4. Discussion is necessary on whether the estimated double diffusive mixing explains water property changes during the present 13 days observations.

Minor points:

- Figure 4: figure for $\log10(\varepsilon_T)$ versus $\log10(\varepsilon_\mu/\varepsilon_T)$ is desirable. From Fig.4c, the

differences are both plus and minus.

- 195th : Fig. 5a → Fig. 5 ?
- 208th : (<$10^{-4.5}$) → (>$10^{-4.5}$) ?
- 217th : ε → K_p ?